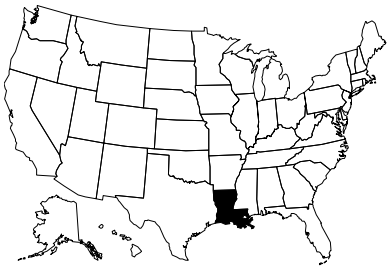
LOUISIANA



Contact Information

Dugan Sabins, Senior Environmental Scientist - Office of Environmental Assessment
Jennifer Lindquist, Environmental Scientist III
Keith Sepulvado, Environmental Scientist III
Louisiana Department of Environmental Quality (LDEQ)
P.O. Box 82178 ■ Baton Rouge, LA 70884-2178
Phone 225/765-0246 ■ Fax 225/765-0617
email: dugan_s@deq.state.la.us
LDEQ Planning homepage: http://www.deq.state.la.us/planning/

Program Description

In Louisiana, bioassessments have been used principally to characterize and delineate reference streams. Bioassessments have also been used for assessing the biological conditions of waterbodies being evaluated for site-specific standards development and use attainability analysis. Bacterial monitoring is conducted for swimming use assessment, Periodic toxicity testing is also conducted. In a very special case, biocriteria were developed for specific wetlands to receive treated disinfected wastewater for wetland restoration.

Further development of bioassessment procedures is dependent on the legal responsibilities and outcome of a consent decree on the Louisiana TMDL program. Any additional development will have to be compatible with TMDL deadlines and deliverables. Since Louisiana does not have biocriteria, there is not a great need for LDEQ to conduct large scale bioassessments to determine criteria attainment. When the concept of biocriteria is adequately thought out and developed for use in state permitting and TMDL programs, then LDEQ will have a larger, more inclusive, bioassessment program. The use and revision of chemical/physical criteria, standards, and assessment procedures are considered the present priority.

The Louisiana Department of Wildlife and Fisheries (LDWF) monitors fishery resources on large rivers and in coastal waters of the state for management purposes and for establishing commercial and recreational regulations on harvest. However, these assessments are not conducted to determine compliance with the Clean Water Act. Environmental agencies are increasing collaboration and coordination with LDWF and are hoping to begin combining monitoring efforts and sharing biological data at a future date.

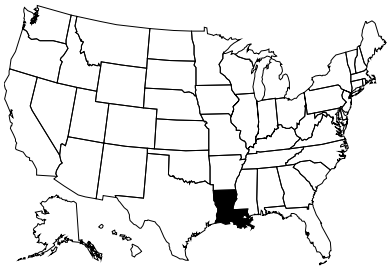
Documentation and Further Information

State of Louisiana Water Quality Management Plan Water Quality Inventory Section 305(b) 2000: http://www.deq.state.la.us/planning/305b/2000/index.htm

Dewalt, R. E. 1997. *Fish and macroinvertebrate taxonomic richness, habitat quality, and in-situ water chemistry of ecoregion reference streams in the Western Gulf Coastal Plains and Terrace Upland Ecoregions of Southern Louisiana*. Prepared for the Louisiana Department of Environmental Quality. Baton Rouge, LA. 72 pages.

Dewalt R. E. 1995. *Biological communities of reference streams in the South Central Plains and Upper Mississippi Alluvial Plains ecoregions of Louisiana*. Prepared for the Louisiana Department of Environmental Quality. Baton Rouge, LA. 85 pages.

LOUISIANA



Contact Information

Dugan Sabins, Senior Environmental Scientist - Office of Environmental Assessment
Jennifer Lindquist, Environmental Scientist III
Keith Sepulvado, Environmental Scientist III
Louisiana Department of Environmental Quality (LDEQ)
P.O. Box 82178 ■ Baton Rouge, LA 70884-2178
Phone 225/765-0246 ■ Fax 225/765-0617
email: dugan_s@deq.state.la.us

Programmatic Elements

Uses of bioassessment within overall water quality program	✓	problem identification (screening)
		nonpoint source assessments
		monitoring the effectiveness of BMPs
	✓	ALU determinations/ambient monitoring
	✓	promulgated into state water quality standards as biocriteria
		support of antidegradation
		evaluation of discharge permit conditions
		TMDL assessment and monitoring
	✓	other: ecoregion reference stream delineation, public education, bacteria assessment for swimming use, occasional toxicity testing, wetlands criteria
Applicable monitoring designs	✓	targeted (i.e., sites selected for specific purpose) *(special projects and specific river basins or watersheds)*
		fixed station (i.e., water quality monitoring stations)
		probabilistic by stream order/catchment area
		probabilistic by ecoregion, or statewide
		rotating basin
		other:

Stream Miles

Total miles *(State based estimation)*	**66,294**
Total perennial miles	–
Total miles assessed for biology*	**–**
fully supporting for 305(b)	n/a
partially/non-supporting for 305(b)	n/a
listed for 303(d)	n/a
number of sites sampled	–
number of miles assessed per site	–

*Bioassessments are not used for 305(b)/303(d) reporting purposes or biocriteria development. Louisiana's 2000 305(b) report listed 7,228 total river and stream miles assessed using chemical/physical criteria for fish and wildlife propagation and limited aquatic life/wildlife designated uses: 1,118 miles fully supporting and 6,110 miles partially/non-supporting for 305(b).

Aquatic Life Use (ALU) Designations and Decision-Making*

ALU designation basis	Class System (A,B,C)	
ALU designations in state water quality standards	Two designations: 1) Fish and wildlife propagation, 2) Limited aquatic/wildlife (a subcategory of fish and wildlife propagation)	
Narrative Biocriteria in WQS	A qualitative and/or narrative scale of condition that supports narrative biocriteria decisions is found in Louisiana's water quality standards, LAC 33:IX.1111.C and 1113.B.12	
Numeric Biocriteria in WQS	none	
Uses of bioassessment data in integrated assessments with other environmental data (e.g., toxicity testing and chemical specific criteria)	✓	assessment of aquatic resources
		cause and effect determinations
		permitted discharges
		monitoring (e.g., improvements after mitigation)
		watershed based management
Uses of bioassessment/ biocriteria in making management decisions regarding restoration of aquatic resources to a designated ALU	Bioassessments have been used to delineate reference streams, which in turn have been used in management decisions for setting DO criteria across ecoregions.	

*Aquatic life use is assessed using chemical/physical numerical and general criteria. Louisiana does have general (narrative) criteria for biological and aquatic community integrity.

Reference Site/Condition Development

Number of reference sites	**16 total**	
Reference site determinations	✓	site-specific
		paired watersheds
		regional (aggregate of sites)
	✓	professional judgment
		other:
Reference site criteria	Least impacted wadeable streams, determined using best professional judgment ("common sense criteria")	
Characterization of reference sites within a regional context	✓	historical conditions *(when information is available)*
	✓	least disturbed sites
		gradient response
		professional judgment
	✓	other: wadeable streams
Stream stratification within regional reference conditions	✓	ecoregions (or some aggregate)
		elevation
		stream type
		multivariate grouping
		jurisdictional (i.e., statewide)
		other:
Additional information	✓	reference sites linked to ALU
	✓	reference sites/condition referenced in water quality standards *(found in LAC 33 33:IX.1113.B.12)*
	✓	some reference sites represent acceptable human-induced conditions

Field and Lab Methods

Assemblages assessed	✓	benthos *(<100 samples/year; multiple seasons, multiple sites - broad coverage for watershed level)*
	✓	fish *(<100 samples/year; multiple seasons, multiple sites - broad coverage for watershed level)*
		periphyton
		other:
Benthos		
sampling gear		collect by hand, dipnet, kick net (1 meter); 500-600 micron mesh
habitat selection		multihabitat, woody debris, richest habitat
subsample size		300 count
taxonomy		family and species
Fish		
sampling gear		backpack and boat electrofishers, Rotenone, seine; 1/8" and 1/4" mesh
habitat selection		multihabitat
sample processing		length measurement and anomalies
subsample		none
taxonomy		species
Habitat assessments		visual based; performed with bioassessments (habitat reference conditions found in WQS, LAC 33:IX.1113.B.12.)
Quality assurance program elements		standard operating procedures and quality assurance plan

Data Analysis and Interpretation

Data analysis tools and methods	✓	summary tables, illustrative graphs
		parametric ANOVAs
	✓	multivariate analysis
	✓	biological metrics *(aggregate metrics into an index)*
		disturbance gradients
	✓	other: nonparametric analysis
Multimetric thresholds		
transforming metrics into unitless scores		cumulative distribution function, North Carolina Biotic Index (NCBI), EPT, fish richness metrics (USEPA 1989)
defining impairment in a multimetric index		cumulative distribution function, NCBI, EPT, fish richness metrics (USEPA 1989)*
Evaluation of performance characteristics		repeat sampling
		precision
Not currently evaluated		sensitivity
		bias
		accuracy
Biological data		
Storage		spreadsheets and paper files
Retrieval and analysis		SAS and Excel

*LDEQ has used biological indices and matrices for evaluating wadeable streams in several ecoregions and for determining appropriate reference sites. These indices and matrices have not been adopted into the water quality standards and are not used to assess impairment for 305(b) or regulatory purposes.